

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1. (Currently Amended) A transmitter apparatus for transmitting an information symbol sequence from a first radio station having an array antenna having M (M is a positive integer and  $M > 1$ ) elements to a second radio station, the transmitter apparatus comprising:

vector control means for producing a plurality of N (N is a positive integer) dimensional vectors, where  $N \leq M$ ; and

vector multiplexing means for producing an M number of vector-multiplexed symbol sequences ~~in the number of N~~ multiplexed by multiplying the plurality of N dimensional vectors ~~by~~ a plurality of symbol sequences containing the information symbol sequence and for transmitting the vector-multiplexed symbol sequences ~~same~~ through the array antenna ~~having M elements~~;

wherein the vector control means produces the plurality of N dimensional vectors based on a propagation parameter corresponding to a propagation channel between the first radio station and the second radio station independent of other propagation channels, and

whereby the vector control means produces the plurality of N dimensional vectors ~~set~~ such that, at the second radio station, at least one symbol sequence containing the information symbol sequence is ~~to be~~ received from ~~of~~ among the plurality of symbol sequences and ~~whereas~~ other symbol sequences ~~are to be~~ canceled.

2. (Cancelled)

3. (Currently Amended) A transmitter apparatus according to claim 21, further comprising propagation channel analyzing means for producing a propagation channel matrix as the propagation parameter,

wherein said vector control means produces ~~at~~the plurality of N dimensional vectors ~~obtained by~~based on singular-value decomposition of the propagation channel matrix.

4. (Currently Amended) A transmitter apparatus according to claim 21, further comprising propagation channel analyzing means for producing a propagation channel matrix as the propagation parameter,

wherein said vector control means produces ~~at~~the plurality of N dimensional vectors ~~obtained by~~based on eigen-value decomposition of a correlation matrix of the propagation channel matrix.

5. (Currently Amended) A transmitter apparatus according to claim 21, further comprising reference symbol producing means for producing a reference symbol known ~~also~~ to the second radio station; and

propagation channel information receiving means for receiving information ~~about~~associated with the propagation parameter transmitted from the second radio station and for determining the propagation parameter from the received information,

wherein the information ~~about~~associated with the propagation parameter is produced from the propagation parameter, ~~which~~the propagation parameter being determined by the second radio station ~~determined from~~ the reference symbol transmitted from the first radio station.

6. (Currently Amended) A transmitter apparatus according to claim 1, wherein the plurality of symbol sequences, ~~in part or all,~~ are, in part or all, symbol-mapped based on modulation schemes different ~~one from another~~each other.

7. (Currently Amended) A transmitter apparatus according to claim 1, wherein the plurality of symbol sequences, ~~in part or all,~~ are, in part or all, spread by code sequences different one from ~~another~~ each other.

8. (Currently Amended) A radio communication method for transmitting an information symbol sequence from a first radio station having an array antenna having M elements to a second radio station, where M is a positive integer and  $M > 1$ , the radio communication method comprising the steps of:

~~an N dimensional vector producing step for the first radio station to generate~~ producing a plurality of N dimensional vectors set by the first radio station, where N is a positive integer and  $N \leq M$ , such that, at the second radio station, at least one symbol sequence containing the information symbol sequence is ~~to be received~~ from among ~~the~~ a plurality of symbol sequences containing the information symbol sequence ~~while~~ and other information symbol sequences are ~~to be canceled~~;

~~a step of multiplying the plurality of N (N is a positive integer) dimensional vectors~~ by the plurality of symbol sequences containing the information symbol sequence and producing an M number of vector-multiplexed symbol sequences ~~multiplexed and in the number of N; and~~

~~a step of transmitting the vector-multiplexed symbol sequences from the first radio station to the second radio station through the array antenna having M elements~~

wherein the step of producing the plurality of N dimensional vectors produces the plurality of N dimensional vectors based on a propagation parameter corresponding to a propagation channel between the first radio station and the second radio station independent of other propagation channels.

9. (Currently Amended) A radio communication method according to claim 8, ~~having~~ including the step of transmitting a reference signal ~~made up by a reference symbol known to the first radio station,~~ from the second radio station to

~~the first radio station having an array antenna having M elements, the reference signal including a reference symbol known to the first radio station,~~

~~wherein, in the N-dimensional vector producing step, the first radio station calculates a the propagation parameter featuring a propagation channel of between the second radio station and the first radio station from based on the reference symbols in the number of M received, and produces the plurality of N-dimensional vectors by using same.~~

10. (Currently Amended) A radio communication method ~~effor~~ transmitting an information symbol sequence from a first radio station having an array antenna having M elements to a second radio station, where M is a positive integer and  $M > 1$ , the radio communication method comprising the steps of:

~~a step of transmitting, from the first station to the second station,~~ a reference signal from the first radio station to the second radio station, the reference signal containing reference symbols known to the second radio station;

~~a step for the second radio station to produce~~producing a channel information symbol sequence by the second radio station from the received reference signal, the channel information symbol sequence containing a propagation parameter featuring~~corresponding to~~ a propagation channel ~~of between the second radio station and the first radio station independent of other propagation channels, from the reference signal received;~~

~~a step of transmitting the channel information symbol sequence from the second radio station to the first radio station;~~

~~a step for the first radio station to produce~~producing a plurality of N (N is a positive integer) dimensional vectors set by the first radio station, where  $N \leq M$ , such that, at the second radio station, at least one symbol sequence containing the information symbol sequence is ~~to be received effrom~~ among a plurality of symbol sequences containing ~~an the information symbol sequence while and other information~~

symbol sequences are ~~to be cancelled, by use of~~ based on the propagation parameter extracted from ~~the channel information~~ symbol sequences received by the first radio station;

~~a step of~~ multiplying the plurality of N dimensional vectors ~~on~~ by the plurality of symbol sequences containing the information symbol sequence and producing an M number of vector-multiplexed symbol sequences ~~multiplexed and in the number of N~~; and

~~a step of~~ transmitting the vector-multiplexed symbol sequences ~~at the array antenna having M elements,~~ from the first radio station to the second radio station through the array antenna.